

WHAT IS CLAIMED IS:

1. An accelerated weight drop for use as a seismic energy

2 source, comprising:

3 a striker positionable over a surface; and

4 a compressed gas spring, said striker slidably coupled to said

5 compressed gas spring, said compressed gas spring configured to

6 drive said striker toward said surface thus creating seismic waves

7 within said surface.

2. The accelerated weight drop as recited in Claim 1 wherein

2 said compressed gas spring includes a gas chamber and a piston,

3 wherein said piston is configured to slide within said gas chamber

4 to compress a gas therein to create a pressure that drives said

5 striker toward said surface.

3. The accelerated weight drop as recited in Claim 2 further

2 comprising a charging port coupled to said gas chamber, said

3 charging port configured to provide said gas within said gas

4 chamber.

4. The accelerated weight drop as recited in Claim 2 wherein

2 a push rod connects said piston to said striker.

5. The accelerated weight drop as recited in Claim 1 further  
2 including a strike plate positionable between said striker and said  
3 surface wherein said striker is configured to strike said strike  
4 plate.

6. The accelerated weight drop as recited in Claim 5 further  
2 including a housing at least partially surrounding said striker and  
3 coupled to said compressed gas spring.

7. The accelerated weight drop as recited in Claim 6 further  
2 including a catch mechanism coupled to said housing and configured  
3 to hold said striker in a cocked position.

8. The accelerated weight drop as recited in Claim 7 wherein  
2 said catch mechanism includes a biased dog coupled to said housing  
3 and configured to cooperatively engage said striker.

9. The accelerated weight drop as recited in Claim 6 wherein  
2 said housing is coupled to a static load and is configured to  
3 transfer said static load to said strike plate.

10. The accelerated weight drop as recited in Claim 9 further  
2 comprising a hydraulic press coupled to said housing, said  
3 hydraulic press configured to create said static load.

11. The accelerated weight drop as recited in Claim 6 further  
2 including an impact isolator coupled to said housing and slidably  
3 coupled to said strike plate.

12. The accelerated weight drop as recited in Claim 11  
2 wherein said impact isolator comprises a plate having a slot formed  
3 therein, wherein a length of said slot is positioned substantially  
4 in line with a line of impact of said striker.

13. The accelerated weight drop as recited in Claim 12  
2 further including an anvil having a pin therein coupled to said  
3 strike plate, wherein said pin is slidably coupled within said  
4 slot.

14. The accelerated weight drop as recited in Claim 1 further  
2 comprising a hydraulic lift coupled to said striker, said hydraulic  
3 lift configured to lift said striker to a cocked position.

15. The accelerated weight drop as recited in Claim 1 wherein  
2 multiple of said compressed gas springs are slidably coupled to  
3 said striker.

16. A method for operating an accelerated weight drop for use

2 as a seismic energy source, comprising:

3 positioning a striker over a surface; and

4 driving said striker toward said surface using a compressed

5 gas spring to create seismic waves within said surface, wherein

6 said striker is slidably coupled to said compressed gas spring.

17. The method as recited in Claim 16 wherein said compressed

2 gas spring includes a gas chamber and a piston, further including

3 cocking said accelerated weight drop by sliding said piston within

4 said gas chamber to reduce a volume of said gas chamber thereby

5 pressurizing a gas located therein, said pressurized gas used to

6 drive said striker toward said surface to create said seismic

7 waves.

18. The method as recited in Claim 17 wherein a push rod

2 connects said piston and said striker, and further wherein a

3 hydraulic lift is coupled to said striker to slide said piston

4 within said gas chamber to reduce said volume of said gas chamber.

19. The method as recited in Claim 18 wherein a catch

2 mechanism holds said striker in a cocked position after sliding

3 said piston within said gas chamber to reduce said volume of said

4 gas chamber.

20. The method as recited in Claim 19 wherein said catch  
2 mechanism includes a biased dog coupled to a housing of said  
3 accelerated weight drop and configured to cooperatively engage said  
4 striker.

21. The method as recited in Claim 19 further including  
2 tripping said catch mechanism thereby causing said striker to drive  
3 toward said surface.

22. The method as recited in Claim 17 wherein a charging port  
2 is coupled to said gas chamber, and further including charging said  
3 gas chamber using said charging port.

23. The method as recited in Claim 16 further including a  
2 strike plate positionable between said striker and said surface  
3 wherein said striker is configured to strike said strike plate.

24. The method as recited in Claim 23 further including a  
2 housing at least partially surrounding said striker and coupled to  
3 said compressed gas spring.

25. The method as recited in Claim 24 further including  
2 coupling said housing to a static load, wherein said housing is

3       configured to transfer said static load to said strike plate.

26.    The method as recited in Claim 24 further including an  
2       impact isolator coupled to said housing and slidably coupled to  
3       said strike plate.

27.    The method as recited in Claim 26 wherein said impact  
2       isolator comprises a plate having a slot formed therein, wherein a  
3       length of said slot is positioned substantially in line with a line  
4       of impact of said striker.

28.    The method as recited in Claim 27 further including an  
2       anvil having a pin therein coupled to said strike plate, wherein  
3       said pin is slidably coupled within said slot.

29.    The method as recited in Claim 25 further comprising a  
2       hydraulic press coupled to said housing, said hydraulic press  
3       configured to create said static load.

30.    The method as recited in Claim 16 wherein driving said  
2       striker toward said surface using a compressed gas spring includes  
3       driving said striker toward said surface using multiple compressed  
4       gas springs.

31. A seismic survey system, comprising:

2 an accelerated weight drop, including;

3 a striker positionable over a surface; and

4 a compressed gas spring, said striker slidably coupled to  
5 said compressed gas spring, said compressed gas spring configured  
6 to drive said striker toward said surface thus creating seismic  
7 waves within said surface;

8 at least one geophone placed proximate said surface, said at  
9 least one geophone configured to collect information from said  
10 seismic waves; and

11 a seismic recorder connected to said at least one geophone,  
12 said seismic recorder configured to record said collected  
13 information.

32. The seismic survey system as recited in Claim 31 wherein

2 said compressed gas spring includes a gas chamber and a piston,  
3 wherein said piston is configured to slide within said gas chamber  
4 to compress a gas therein to create a pressure that drives said  
5 striker toward said surface.

33. The seismic survey system as recited in Claim 31 further

2 including a strike plate positionable between said striker and said  
3 surface wherein said striker is configured to strike said strike  
4 plate.

34. The seismic survey system as recited in Claim 33 further  
2 including a housing at least partially surrounding said striker and  
3 coupled to said compressed gas spring.

35. The seismic survey system as recited in Claim 34 further  
2 including a catch mechanism coupled to said housing and configured  
3 to hold said striker in a cocked position.

36. The seismic survey system as recited in Claim 34 wherein  
2 said housing is coupled to a static load and is configured to  
3 transfer said static load to said strike plate.

37. The seismic survey system as recited in Claim 36 further  
2 including an impact isolator coupled to said housing and slidably  
3 coupled to said strike plate.

38. The seismic survey system as recited in Claim 37 wherein  
2 said impact isolator comprises a plate having a slot formed  
3 therein, wherein a length of said slot is positioned substantially  
4 in line with a line of impact of said striker.

39. The seismic survey system as recited in Claim 38  
2 further including an anvil having a pin therein coupled to said  
3 strike plate, wherein said pin is slidably coupled within said

4 slot.